GUIDE TO REQUIREMENTS
FOR A WATERWORKS SYSTEM
CONSISTING ONLY OF A DISTRIBUTION SYSTEM

December 2004

Alberta Environment

DISCLAIMER

This guide provides a broad overview of Alberta Environment's requirements for a waterworks distribution system. It does not replace or affect the legislative requirements. The person responsible for a waterworks distribution system must follow all of the legislated requirements. If there is any conflict between this document and the *Environmental Protection and Enhancement Act* (*EPEA*) or the *Water Act* and their regulations, *EPEA* or the *Water Act* and their regulations take precedence.

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INTRODUCTION

Waterworks systems consisting solely of a water distribution system must be registered with Alberta Environment and follow the *Code of Practice for a Waterworks System Consisting Solely of a Water Distribution System*. This is a guide to registration and the *Code of Practice*.

WHICH WATER DISTRIBUTION SYSTEMS REQUIRE REGISTRATION?

Waterworks systems consisting only of a distribution system, that obtain potable water from systems approved by Alberta Environment or from systems meeting Alberta Environment standards and approved by other federal agencies, must be registered with Alberta Environment. Waterworks systems for cities, towns, villages, summer villages and small systems with more than 15 service connections (to separate lots) or more than 3 km of distribution lines must also be registered. A complete list of waterworks facilities requiring a registration can be found in Schedule 2, Division 5 of the *Activities Designation Regulation* of *EPEA*.

A registration is issued for activities specified in the application. Any change to an activity, or how it is carried out, requires notification in writing to the Director at Alberta Environment. The registration will then be changed to reflect the actual activities carried out. For example, notification is required if the distribution system is upgraded to provide new or additional chlorine booster stations, or to supply water to additional systems/homes not previously included or authorized.

Water distribution systems operating under an *EPEA* approval on October 1, 2003 are automatically registered. The system must continue to operate in accordance with the latest approval and the *Potable Water Regulation*, until the Director notifies the registration holder in writing. The registration holder may request to the Director in writing to operate the facility according to the Code of Practice. The Director may grant the request and specify the date the facility must begin following the Code of Practice.

HOW TO REGISTER

Step 1:
Refer to the following web page for the registration process:
www.gov.ab.ca/env/protenf/approvals/factsheets/EPEA_RegistrationProcess.pdf

Step 2:
The general requirements for registering are specified in the *Approvals and Registrations Procedure Regulation*. The Code of Practice outlines additional information to be submitted specific to water distribution systems (Section 3.1.3). The application must contain all information such as:

- Who is responsible for the waterworks system?
- What is the capacity and size (design) of the waterworks system?
- Where is the waterworks system located?
- When will the system be constructed and operated?
- Why is the system needed?

The application should include information related to previous approvals and other approvals required for the system.

Step 3:
Registration must be obtained before construction can begin. Applications will not be reviewed until they are complete. Due to the complexity of some applications, it is advisable to contact Department staff early in the process.

Step 4:
Send all registration applications to:

Alberta Environment
Regulatory Approvals Centre
Main Floor, Oxbridge Place
9820 – 106 Street
Edmonton, Alberta T5K 2J6
Phone: (780) 427-6311 (to connect toll-free first dial 310-0000)
Fax: (780) 422-0154

The Regulatory Approvals Centre will record receipt of the application and forward it to the appropriate Director in the region for which the project is being proposed.

Step 5:
Facilities that already hold a registration and require modifications shall inform the Director in writing of their intentions. Contact the Regulatory Approvals Centre for the Alberta Environment District Office nearest you.

WATERWORKS DISTRIBUTION SYSTEM DESIGN REQUIREMENTS

The minimum design requirements for a waterworks distribution system are set out in the *Potable Water Regulation*, and specified in detail in the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*. New systems must meet the design standards in existence at the date of registration. Any proposed deviations from the standards must be identified in the registration application, or authorized in writing by the Director.

Systems operating when new standards are published are not required to meet these new standards until the system is expanded or upgraded, or the Director gives written notice.

Domestic wastewater from water distribution systems such as sinks and washrooms must be disposed of into either a wastewater collection system that is approved or registered under *EPEA*, or a system permitted under the *Safety Codes Act*.

Any wastewater generated by water main disinfection must be disposed of into an approved wastewater collection system, or de-chlorinated before being discharged into a storm water drainage system.

TYPES OF TREATMENT REQUIRED OR ALLOWED

No further treatment is required where water supplied to a waterworks distribution system is already chlorinated, and meets the health-related physical, microbiological, chemical, and radiological concentration limits required. The chlorine residual should be maintained throughout the distribution system.

Some water may exceed the Aesthetic Objectives (AO) specified in the *Guidelines for Canadian Drinking Water Quality (GCDWQ)*. Treatment to meet the AO's is at the discretion of the registration holder for the waterworks distribution system. If the water is treated, the facility must be registered under the *Code of Practice for Waterworks Systems using High Quality Groundwater*.

The addition of chemicals, including disinfection chemicals such as sodium hypochlorite, is a regulated activity. Chemical use requirements are specified in the *Potable Water Regulation*. Any treatment chemicals added to a waterworks system must meet the National Sanitation Foundation (NSF) Standard 60, or be authorized by the Director. The maximum dosage must not be exceeded. If the manufacturer specifies a lower dosage than NSF, then the manufacturer's maximum dosage must not be exceeded unless authorized by the Director.

SPECIFIC CODE OF PRACTICE REQUIREMENTS

Certified Operator

Certified operators are required to operate waterworks distribution systems. For more information on operator certification, please refer to the *Water & Wastewater Operators' Certification Guidelines* published by Alberta Environment.

Depending on the system and population served, different distribution certification may be required:

- A Small Water Systems Certificate (includes treatment and distribution) is required for a water system serving less than 500 people.
- A Water Distribution Certificate is required for a water distribution system serving 500 or more people. The level is dependent on population served.

The Code of Practice sets out the number of operators required, as well as their minimum qualifications. The registration holder for a water distribution system with a single operator must arrange to provide backup operators.

Limits and Monitoring

The waterworks system must meet specified limits and be monitored routinely during its operation. Monitoring frequency varies from daily monitoring of the chlorine residual to complete annual analysis of the treated water. The primary monitoring requirements are set out in the Code of Practice; however the *Potable Water Regulation* also provides the Director with discretion to require additional monitoring.

Section 2.2.2 of the Code of Practice requires that analysis be conducted at an approved laboratory, unless otherwise specified in writing by the Director. Approved laboratories are laboratories that are accredited by the Standards Council of Canada to analyse for the parameters that must be monitored and reported under this code, except as indicated under Alberta Environment's *"Laboratory Data Quality Assurance Policy"*.

Distribution-only systems, which obtain their supply from an already treated source, must monitor once every three years. Alberta Environment may do some monitoring as part of a Treated Water Survey, but the registration holder should use those results to supplement regular testing. Alberta Environment will supply the results of a Treated Water Survey and indicate in writing that the results may be used as part of compliance monitoring. At a minimum, the receiving waterworks system should obtain the results of testing on the supplying system for information about the quality of water supplied.

- Trihalomethanes (THM's)
  Monitoring for trihalomethanes (THMs) is required in a multi-level scheme described below. Due to the seasonal variability of THMs, compliance with the limit is based on the rolling annual average of quarterly samples, taken at the same location.

Initially, a comprehensive assessment is required to determine the status with respect to the THM limit. If the rolling annual average of quarterly samples exceeds the Maximum Allowable Concentration (MAC) in the GCDWQ, the facility may reduce the frequency of monitoring (based on population served) to the level specified in the Code of Practice, to verify that the limits are being met. If at any time the rolling annual average is exceeded, the facility must return to the most intensive monitoring requirement as stipulated in Sections 5.1.8 and 5.1.9 of the Code of Practice. A facility may only return to the less frequent verification monitoring level if none of the discrete quarterly samples, in a period of one year, exceed the MAC in the GCDWQ.

- Bacteriological Analysis

  Bacteriological analysis must be performed according to the GCDWQ for the population served, without any reduction in the number of samples or frequency of sampling. Collection of samples in excess of the minimum requirement is encouraged to demonstrate safe water and show diligence in meeting requirements.

  The *Potable Water Regulation* requires that these samples be taken at equal intervals throughout the monthly sampling period. Every effort must be made to evenly distribute the frequency of sampling, taking into account facility operating schedules and local health unit courier schedules. For example, a facility required to take eight samples a month should sample each Monday and on the last day of the week the provincial courier runs.

  It is important to have an alternate method (private courier, bus, personal delivery) of transporting samples directly to the Provincial Laboratories when the local health unit courier is not available. The Provincial Laboratories have routine pick-ups at bus depots and will send for a special pick-up when they are advised of a shipment. Drop boxes are also available outside the labs for after-hours deliveries.

- Chlorine Residual

  Chlorine residual, measured as free or total chlorine, must be monitored a minimum of five days per week. Alberta Environment recommends daily (seven days per week) or continuous monitoring. Total chlorine may exist as free chlorine, combined chlorine, or a combination of the two forms.

  Monitoring must be done at random sites throughout the distribution system and rotated so samples are taken from the entire distribution system over time as specified in Table 5-2 of the Code of Practice. This helps identify areas where chlorine residuals may be too low due to problems such as low flows, inadequate looping, excess disinfectant demand, etc. If areas of concern are identified, suitable corrective measures must be taken to avoid loss of chlorine in the distribution system.

  Continuous monitoring of chlorine residual entering the distribution system is recommended, as are automated alarms to notify the operator in case of low chlorine residual.

Reporting
If there is a contravention of any condition of the Code of Practice, regulations, or the *Water Act*, the registration holder is required to immediately report the contravention to the Director at (780) 422-4505. All reasonable corrective action must be taken to end the contravention, minimize the effects of the contravention, and prevent the contravention from recurring in the future.

Adverse bacteriological results may require reporting and follow up with the Health Authority and the Alberta Environment District Office under the *Communication and Action Protocol for Failed Bacteriological Results in Drinking Water for Waterworks Systems* regulated under the *Environmental Protection and Enhancement Act*.

Monthly reports are required to contain all of the monitoring information collected. These reports are to be compiled and retained according to the record keeping section of the Code of Practice. It is not necessary to submit these reports unless the Director has given notice that a monthly report is required. Electronic submission of results should be planned for.

Annual reports must be compiled and submitted to the Director by February 28 of the following calendar year. This report must contain the annual sample results, and a summary of all of the monthly reports, including the average, minimum and maximum values for each parameter monitored. The information provides a quick reference regarding the overall performance of the system.

Record Keeping
The registration holder must keep all information and documentation generated in designing, constructing, and operating a high quality groundwater waterworks system. Inspectors, investigators and the Director may request this information at any time.

Reclamation
Since Waterworks facilities tend to be designed, constructed and operated to have a very long lifespan, there is no requirement to have a reclamation plan included in the registration application. However, the Code of Practice requires that prior to decommissioning, a reclamation plan must be developed and authorized by the Director. If there are any items of concern in the plan, the Director can specify the requirements as conditions within the authorization issued for the reclamation.

Operations Program
Schedule 1 of the Code of Practice lists the minimum requirements for the Operations Program. This program should be considered as an "owner's manual." All routine and foreseeable operational events and actions must be included in the program. The program must be sufficiently comprehensive to allow a certified operator who is unfamiliar with the system to take over operation at any time.

Any comments, questions, or suggestions regarding the content of this document may be directed to:

Alberta Environment
Drinking Water Branch
8th Floor, Oxbridge Place
9820 – 106 Street
Edmonton, Alberta T5K 2J6
Phone: (780) 644-4959

Additional copies of this document may be obtained by contacting:

Alberta Environment
Education & Information Centre
Main Floor, Oxbridge Place
9820 – 106 Street
Edmonton, Alberta T5K 2J6
Phone: (780) 427-2700
Email: env.infocent@gov.ab.ca

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If you have any questions or would like more information, contact your local Alberta Environment office. For toll free access, dial 310-0000 from anywhere in Alberta.

APPENDIX

The following are some of the documents that impose or clarify require nents and obligations for protecting public health and the environment at this type of facility.

- *EPEA* *Part 2, Division 2 (Approvals, Registrations and Certificates)*
  Part 7 (Potable Water)
  Part 10 (Enforcement)
- *Activities Designation Regulation, AR 211/96*
- *Approvals and Registrations Procedure Regulation, AR 113/93*
- *Environmental Protection and Enhancement (Miscellaneous) Regulation, AR 118/93*
- *Potable Water Regulation, AR 122/93*
- *Water Act*
- *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, ("Standards and Guidelines document")* published by Alberta Environment
- *Code of Practice for a Waterworks System Consisting Solely of a Water Distribution System*
- In addition to the EPEA requirements, most waterworks facilities will have additional regulatory requirements under the *Water Act* for diversion and consumptive use of the water source.